

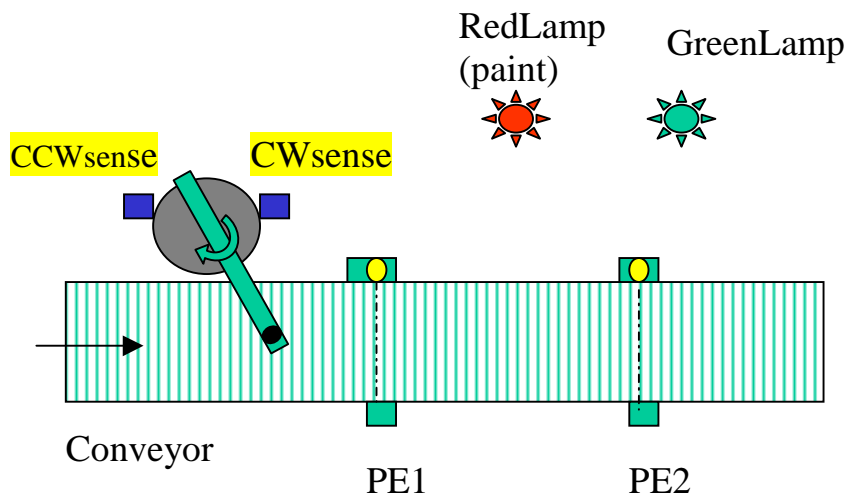
EE599: Applied Controls (Spring 2001)

PROJECT DESCRIPTION (Description of problem)

PLEASE NOTE THE CORRECTIONS (April25):

CCWsense and CWsense have been swapped (corrected)

Address for RedLamp has been corrected.



You will design the controller for a paint system. The system has a conveyor that takes parts to a paint robot. The robot sweeps over the part, before the part then moves on.

The system has the following inputs and outputs:

Inputs:

I:3/0 "On" switch

I:3/1 Arm Clockwise position sense (CW sense)

I:3/2 Arm Counterclockwise sense (CCW sense)

I:3/3 Conveyor sensor 1 (PE1 = photoeye 1) –ACTIVE LOW!

I:3/4 Conveyor sensor 2 (PE2 = photoeye 2) – ACTIVE LOW!

Outputs:

O:1/0 Powersupply (this will be explained more later)

O:2/0 Sensor lamps (across conveyor from PE1 and PE2)

O:2/1 Conveyor motor

O:2/2 Arm motor direction (high is clockwise)

O:2/3 Arm motor power

O:2/4 Green lamp

O:2/5 Red lamp (paint spray is active)

Control requirements:

Your program must first turn on power (O:1/0).

The sensor lamps must be on for the conveyor sensors to work. You should turn on these sensor lamps only while the “On” switch is on. (All actuators and lamps should be off when the switch is off.)

When the “On” switch is turned on, the conveyor should start. It should run until PE1 indicates the presence of a part at the paint station. At this point, the conveyor should turn off. The paint arm, which is assumed to have started in its CCW position, should be moved to the CW position, and then back to the CCW position. While the arm moves, the paint should be spraying (represented by the Red lamp being on).

After a complete spray operation, the Red lamp should be off. The green light should turn on and stay on for 2 seconds, indicating the process is complete. The conveyor should then turn on again. The system should be ready to receive another part.

(Note that we do not use PE2 in this example.)

ASSIGNMENT:

You must write and demonstrate a control program on the PLC. This program must satisfy the above requirements. You must hand in the following:

- 1) a printout of your program.
- 2) A description of your program logic, including the state machine that you used.
- 3) You must demonstrate your program to Dr. Holloway.

All this must be done by Tuesday, 5/01/01, by 4:30pm. (Note that your final exam time is 8:00am on Tuesday, but you have until 4:30pm to complete the project.)